

CLAIMS

- 1 1. An ear probe comprising:
2 a base portion housing at least one signal transducing device; and
3 a cap portion extending from the base portion, the cap portion defining a
4 channel for signal transmission and a plurality of pedestal surfaces.
- 1 2. The ear probe of claim 1, wherein the cap portion includes a protrusion
2 extending away from the cap portion at an angle to a longitudinal axis of the channel
3 of the cap portion.
- 1 3. The ear probe of claim 2, wherein the angle is greater than 45 degrees.
- 1 4. The ear probe of claim 2, wherein the protrusion is angled.
- 1 5. The ear probe of claim 1, wherein the cap portion includes an alignment
2 feature that inhibits radial rotation of an ear probe tip attached to the ear probe about a
3 longitudinal axis of the channel.
- 1 6. The ear probe of claim 5, wherein the alignment feature is a fin.
- 1 7. The ear probe of claim 5, wherein the alignment feature is a projection
2 extending from a proximal end of the cap portion.
- 1 8. The ear probe of claim 1, wherein the signal transducing device is a
2 microphone.
- 1 9. The ear probe of claim 1, wherein the signal transducing device is a speaker.
- 1 10. The ear probe of claim 1, further comprising a light source to aid in a visual
2 inspection of an ear of a subject.
- 1 11. The ear probe of claim 10, wherein the light source is a light emitting diode.
- 1 12. An ear probe comprising:
2 a base portion housing at least one signal transducing device; and
3 a cap portion extending from the base portion, the cap portion comprising at
4 least one pedestal portion including a protrusion extending away from the pedestal
5 portion at an angle to a longitudinal axis of the cap portion.
- 1 13. The ear probe of claim 12, wherein the at least one pedestal portion includes a
2 plurality of protrusions.
- 1 14. The ear probe of the claim 12, wherein the protrusion is angled.

- 17 -

- 1 15. The ear probe of claim 14, wherein the protrusion is a ring encircling the
2 pedestal portion.
- 1 16. The ear probe of claim 12, wherein the cap portion defines at least two
2 channels for signal transmission.
- 1 17. The ear probe of claim 16, wherein the cap portion includes an alignment
2 feature that inhibits radial rotation of an ear probe tip attached to the ear probe about
3 the longitudinal axis of the cap portion.
- 1 18. The ear probe of claim 17, wherein the alignment feature is a fin.
- 1 19. The ear probe of claim 18, wherein the fin is positioned between the at least
2 two channels.
- 1 20. The ear probe of claim 17, wherein the alignment feature is a projection
2 extending from a proximal end of the cap portion.
- 1 21. The ear probe of claim 12, wherein the cap portion includes a plurality of
2 pedestal portions.
- 1 22. The ear probe of claim 12, wherein the signal transducing device is a
2 microphone.
- 1 23. The ear probe of claim 12, wherein the signal transducing device is a speaker.
- 1 24. The ear probe of claim 12, wherein the signal transducing device is a light
2 source.
- 1 25. The ear probe of claim 24, further comprising a light source to aid in a visual
2 inspection of an ear of a subject.
- 1 26. An ear probe comprising:
2 a base portion housing at least one signal transducing device; and
3 a cap portion defining at least two channels for signal transmission, the cap
4 portion including an alignment feature that inhibits radial rotation of an ear probe tip
5 secured to the cap portion about an axis extending between a distal end of the cap
6 portion and a proximal end of the cap portion.
- 1 27. The ear probe of claim 26, wherein the alignment feature is a fin.
- 1 28. The ear probe of claim 27, wherein the fin is disposed between the at least two
2 channels.
- 1 29. The ear probe of claim 26, wherein the alignment feature is a projection
2 extending from the proximal end of the cap portion.

- 1 30. The ear probe of claim 26, wherein the cap portion includes a pedestal portion.
- 1 31. The ear probe of claim 30, wherein the cap portion includes a protrusion
2 extending away from the pedestal portion at an angle to the axis.
- 1 32. The ear probe of claim 26, wherein the cap portion includes a plurality of
2 pedestal portions.
- 1 33. The ear probe of claim 26, wherein the signal transducing device is a
2 microphone.
- 1 34. The ear probe of claim 26, wherein the signal transducing device is a speaker.
- 1 35. The ear probe of claim 26, further comprising a light source to aid in a visual
2 inspection of the an ear of a subject.
- 1 36. The ear probe of claim 35, wherein the light source is a light emitting diode.
- 1 37. An ear probe comprising:
2 a base portion including means for transmitting signals to the ear; and
3 a cap portion extending from the base portion, the cap portion including a first
4 means for securing a tip to the cap portion and a second means for preventing radial
5 rotation of the secured tip about the cap portion.
- 1 38. A tip for an ear probe, the tip comprising:
2 a distal end;
3 a proximal end; and
4 a body extending between the distal end and the proximal end, the body
5 including an exterior surface and an interior surface, the interior surface defining at
6 least two channels and an alignment slot for providing proper positioning of the ear
7 probe tip to the ear probe.
- 1 39. The tip of claim 38, wherein at least a portion of the exterior surface of the
2 body includes a texture.
- 1 40. The tip of claim 39, wherein the texture includes microbumps.
- 1 41. The tip of claim 40, wherein the microbumps are continuous about the
2 circumference of the tip.
- 1 42. The tip of claim 38, wherein the tip is disposable.
- 1 43. The tip of claim 42, wherein the body further includes a feature that
2 mechanically weakens the tip so that the tip tears upon removing the tip from the ear
3 probe.

- 1 44. The tip of claim 43, wherein the feature is an aperture.
- 1 45. A tip for an ear probe, the tip comprising:
2 a distal end;
3 a proximal end; and
4 a body extending between the distal end and the proximal end, the body
5 including a means for coupling with the ear probe so that proper alignment between
6 the tip and the ear probe is ensured.
- 1 46. An ear probe system comprising:
2 a probe comprising:
3 a base portion housing at least one signal transducing device; and
4 a cap portion extending from the base portion, the cap portion defining
5 a first channel and including a protrusion extending away from the cap portion at an
6 angle to a longitudinal axis of the channel; and
7 a tip defining a second channel, the tip being secured to the cap portion of the
8 probe such that the protrusion maintains a tension fit between the probe and the tip to
9 create a continuous channel extending from the first channel to the second channel.
- 1 47. The ear probe system of claim 46, wherein no portion of the first channel is
2 disposed within the second channel when the tip is secured to the probe.
- 1 48. The ear probe system of claim 47, wherein no portion of the second channel is
2 disposed within the first channel when the tip is secured to the probe.
- 1 49. The ear probe system of claim 46, wherein the protrusion is angled.
- 1 50. The ear probe of claim 49, wherein the protrusion is a ring encircling the
2 pedestal portion.
- 1 51. The ear probe system of claim 46, wherein the tip and the probe include a
2 visual guide feature to provide proper radial alignment of the tip to the probe.
- 1 52. The ear probe system of claim 51, wherein the visual guide comprises a
2 projection extending from the probe and a corresponding cutout disposed on the tip.
- 1 53. The ear probe system of claim 46, wherein the second channel is sized to
2 prevent the first channel from contacting debris in an ear of a subject when the tip is
3 secured to the probe and is positioned in the subject's ear.
- 1 54. The ear probe system of claim 46, wherein the signal transducing device is a
2 microphone.

1 55. The ear probe system of claim 46, wherein the signal transducing device is a
2 speaker.

1 56. The ear probe system of claim 46, further comprising a light source to aid in a
2 visual inspection of the subject's ear.

3 57. The ear probe system of claim 56, wherein the light source is a light emitting
4 diode.

1 58. An ear probe system comprising:
2 a probe defining a first probe channel and a second probe channel and
3 including a first alignment feature; and
4 a tip defining a first tip channel and a second tip channel and including a
5 second alignment feature, the first alignment feature of the probe mating with the
6 second alignment feature of the tip to ensure alignment of the first probe channel with
7 the first tip channel when the tip is secured to the probe.

1 59. An ear probe system comprising:
2 a probe defining a first probe channel and a second probe channel;
3 a tip defining a first tip channel and a second tip channel, and
4 means for automatic alignment of the first probe channel to the first tip
5 channel when the tip is positioned on the probe.

1 60. An ear probe system comprising:
2 a probe comprising:
3 a base portion housing at least one signal transducing device; and
4 a cap portion extending from the base portion, the cap portion defining
5 a first probe channel and a second probe channel and including (i) a protrusion and (ii)
6 a tip alignment feature, the tip alignment feature disposed between the first and
7 second probe channels; and
8 a tip comprising an exterior surface and an interior surface, the interior surface
9 defining a first tip channel, a second tip channel, and a probe alignment slot,
10 wherein the tip alignment feature has a greater length along a longitudinal
11 direction of the ear probe system than the probe alignment slot so as to stretch the tip
12 over the protrusion during attachment of the tip to the cap portion of the probe.

1 61. A method of attaching a tip to a probe, the method comprising the steps of:
2 (a) providing a probe comprising:

- 21 -

3 a base portion housing at least one signal transducing device; and
4 a cap portion extending from the base portion, the cap portion defining
5 a first probe channel and a second probe channel and including (i) a protrusion and (ii)
6 a tip alignment feature, the tip alignment feature disposed between the first and
7 second probe channels;
8 (b) positioning a tip comprising an exterior surface and an interior surface, the
9 interior surface defining a first tip channel, a second tip channel, and a probe
10 alignment slot, the probe alignment slot having a smaller length along a longitudinal
11 direction of the ear probe system than the tip alignment feature of the probe; and
12 (c) stretching the tip over the tip alignment feature of the probe such that a
13 portion of the tip is secured by the protrusion.